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National Aeronautics and
Space Administration

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Houston, Texas 77058

JSC-17377

PROGRAM DOCUMENTATION

USER'S GUIDE

for

CCT2WA

(Converting CCT's to Word-addressable file)

Job Order 52-309

Prepared By

Lockheed Engineering and Management Services Company

Houston, Texas

Contract NAS 9-15800

for

THERMAL TECHNOLOGY BRANCH
STRUCTURES AND MECHANICS DIVISION
ENGINEERING AND DEVELOPMENT DIRECTORATE

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PROGRAM DOCUMENTATION

USER'S GUIDE

for

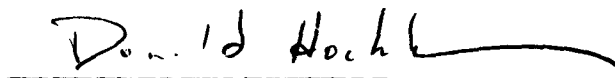
CCT2WA

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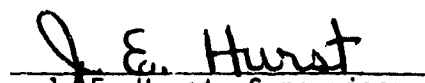
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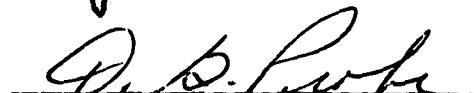
Prepared by


S. D. Williams


D. B. Hackler

APPROVED BY


J. E. Hurst, Supervisor
Thermal Technology Section


D. G. Probe, Manager
Applied Mechanics Department

Lockheed Engineering and Management Services Company
Houston, Texas

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1. INTRODUCTION

The Shuttle Orbiter Post-Flight Data will be made available on Computer Compatible Tapes (CCT). These CCT's will be 9-track, odd parity tapes written in a manner that cannot properly be read with a standard FORTRAN READ statement.

Each CCT contains both header and data records. While the data is recorded on the tape in a manner convenient for recording time-history data it is not in a form amenable for ease in plotting or providing other type analysis. In addition, it is desirable to have the data on a mass storage file that allows for rapid access of the desired data and permits the release of the tape drive to other system users.

The CCT2WA program has been developed to convert the CCT data to a word-addressable mass storage file. This will permit the access of the data in an expeditious manner to prevent critical schedules from being impacted. The objective is to assist analysts in obtaining the data in a simple and timely manner.

2. DISCUSSION

This program, CCT2WA, converts a Computer Compatible Tape (CCT) to a word-addressable mass storage file. The word-addressable file is structured to permit access to the data in a manner much faster than can be accomplished through FORTRAN binary file reading or Direct-Access File reading. The word-addressable file is segregated into three discrete areas; the preamble, header, and data.

The preamble consists of 30 words which are common to all word-addressable format CCT's. This consists of the tape ID, the starting and ending times requested for the CCT, whether the data is fixed or full rate, the addresses for the beginning of the time and skew data, the number of measurements for this CCT, the number of scans, the number of header records on the CCT, and the reference base time for this data (in seconds).

The header consist of the information required to obtain data from the word-addressable file. This consists of eight (8) different sets of data that permits rapid access to the data. These sets based on the number of measurements, are:

1. The beginning address on the file for the measurement data.
2. The measurement numbers.
3. The number of samples/scan for each measurement.
4. The time delta for the first sample for the measurements.
5. The time delta between contiguous samples for the measurements.
6. The word number in the data scan containing the time skew for the measurements.
7. The engineering units for the measurements.
8. The number of data points for the measurements.

The data consists of three distinct types related to each measurements:

1. The times associated with each data scan.
2. The time skewing data associated with each measurement. There are ten different skew arrays that can be used for "full rate" data.

3. The actual data available for each measurement in single precision or double precision.

This program, CCT2WA, requires a minimum of information from the user while providing a synopsis of the information that has been converted.

3. PROGRAM USAGE

Use of this conversion program is simple. It requires a run deck as shown in figure 1 or 2, minimal input data, and the necessary tapes.

3.1 PROGRAM ORGANIZATION

The main program reads the user input data. If the CCT has not been previously assigned the program will assign the CCT, and direct its use to unit 1. Based upon the information supplied by the user the program assigns a temporary word-addressable file to unit 10. This file is usually greater than will be required to hold all of the data on the CCT. The program calls subroutine CCTHDR to read the header records from the CCT. This subroutine builds part of the word-addressable files header record, prints out summary information, maintains in common the necessary information to read the data, and establishes part of the preamble data. The program then calls subroutine CCTRD which reads the CCT's data records. CCTRD stores the time, skew data, and measurement data for each scan in the appropriate array. The subroutine then determines if any array is filled (i.e. has 100 values). If an array is filled the data for that array is copied into the temporary word-addressable file. The appropriate flags are updated to determine where the data for the next CCT will be stored. The subroutine continues this process until all of the data on the CCT has been read. After all the data has been read the subroutine writes all of the data remaining in core to the word-addressable file.

At this stage the program indicates that the data has been collected on the temporary word-addressable file and calculates the required size of the permanent word-addressable file. The program then assigns unit 11 for the permanent word-addressable file.

The program calls subroutine CCTPK1 which builds the preamble and header information in the permanent word-addressable file. Next, the program calls subroutine CCTPK2 which reads the temporary word-addressable file and stores the data in the permanent word-addressable file. For all practical purposes,

the permanent file is packed in order to contain the data in the minimum space. The program releases the CCT and the temporary word-addressable file. The permanent file, unit 11, is retained by the program to permit the user to access the file or save it onto a tape. A schematic flow of the system can be seen in figure 3.

3.2 INPUT DESCRIPTION

The input data consists of user input and the CCT. The user input is via NAMELIST control \$CCT. The NAMELIST variable names and definition can be found in Appendix A. It should be pointed out that the beginning and ending times are used to define the size of the temporary word-addressable file and the starting addresses for the data in this file. If the difference between the beginning and ending times is less than for the actual data on the CCT the last part of the data will not be stored on the word-addressable file. It is recommended that the ending time should be increased by at least 100 seconds as a safety factor.

The CCT's are 9-track, odd parity tapes written in a manner that cannot properly be read with a standard FORTRAN READ statement. This program uses NTRAN to read the CCT. Each CCT contains both header and data records. The data records follow immediately after the header records. A description of the header records can be seen in table I, and the data records and scans can be seen in table II. The special flag values in the data used to indicate data errors or data termination can be seen in table III.

3.3 OUTPUT DESCRIPTION

All of the header records on the CCT are read before any printout is given. After the header records have been read the following information is provided:

1. Whether the CCT was a "full rate" or a "fixed rate" tape.
2. The requested beginning and ending times.
3. The number of measurements and the maximum samples/scan.
4. The data blocking factor for the temporary word-addressable file.

5. The number of data words/record and the number of words/data scan.
6. The tabulation of the measurement number, engineering units, data word precision on the CCT, the number of samples/scan, the time delta for the first sample, and the time delta between contiguous samples.

If the full list option was selected a very large volume of intermediate printout is supplied. A basic sketch of the detailed information provided is:

1. The scan number being read from the CCT.
2. An indication of additional CCT records read to obtain measurement data.
3. When the arrays have been filled the number of data points written to the temporary word addressable file for each measurement.
4. When all of the CCT data has been collected (usually after the last record has been read) item (3) is repeated to complete the data on the temporary word-addressable file.

After all of the data has been collected and transferred into the temporary word-addressable file the following information is provided:

1. The number of data scans read from the CCT.
2. The base time for the CCT. This is the time value on the first data scan.

After the header records have been built and packed in the permanent word-addressable file the following information is provided:

1. The starting word-addresses for the ten skew times.
2. The starting word-address for the data scan time.
3. The base time for the CCT.
4. The total number of data points.

5. The measurement numbers, number of data points for each measurement, and the starting address for each measurement.

If the full list option was selected the program will print the number of words packed into the permanent file for each measurement.

After all data has been packed the program indicates that all of the data has been packed and tells the user how to save the data on a tape for later use. A schematic sketch of the permanent word-addressable file configuration can be seen in figure 4.

All of the measurement data is stored on the permanent word-addressable file in single precision.

3.4 COPYING THE WORD-ADDRESSABLE FILE

The permanent word-addressable file contains a large quantity of data. It is not desirable to maintain the word-addressable file on a secure file. Unfortunately, the UNIVAC system FURPUR processor cannot be used to copy these files to another device. Four processors were written to copy word-addressable files from mass storage to mass storage. These processors reside on the UNIVAC 1110 secure file ES3-L97086*ES3UTIL. The following sections describe how to use these processors and the restrictions for using them. To simplify the discussion, assume the user has copied the absolutes into a file U, or has made the following command:

```
@USE U,ES3-L97086*ES3UTIL
```

3.4.1 Drum to Drum Copy

The format for copying from drum to drum is:

```
@U.DRM2DRM INPUTFILE.,OUTPUTFILE.
```

The processor will respond with

```
XXXXXXXXXX words have been transferred.
```

3.4.2 Drum to Tape Copy

The format for copying drum to tape is:

@U.DRM2TAP INPUTFILE.,OUTPUTFILE.

The processor will respond with:

XXXXXXXXXXXX words have been transferred.

3.4.3 Tape to Drum Copy

The tape must have been created by the DRM2TAP processor. The format for copying from tape to drum is:

@U.TAP2DRM INPUTFILE.,OUTPUTFILE.

The processor will respond with:

XXXXXXXXXXXX words have been transferred.

3.4.4 Tape to Tape Copy

The input tape must have been created by the DRM2TAP processor. The format for copying from tape to tape is:

@U.TAP2TAP INPUTFILE.,OUTPUTFILE.

The processor will respond with:

XXXXXXXXXXXX words have been transferred.

3.4.5 Restrictions

These processors were written in FORTRAN V and use units 26 and 27 for input and output, respectively. The user must not have units 26 and 27 assigned prior to using these processors. In addition, these processors do not do a dynamic assign. It is the responsibility of the user to assign the files to the run prior to any attempt to use the processors. For drum mass storage files the initial reserve must be zero, and the device must be D40 i.e.,

@CAT,P FILE,D40///number of words
@ASG,A FILE.

or

@ASG,CP FILE,D40///number of words

The maximum number of words that can be assigned to a drum file is 93,126,656 words. The maximum number of words that can be copied onto a 1200 foot magnetic tape is:

19,492,384 words on 6250 bpi - 9 track

5,086,092 words on 1600 bpi - 9 track

2,543,046 word on 800 bpi - 9 track

It is recommended that the file should be copied onto 6250 bpi - 9 track tapes. The user should record the number of words copied for assigning drum files.

3.5 RESTRICTIONS

This program is restricted to reading single reel CCT's. These CCT's can be either "fixed rate" or "full rate". The "fixed rate" tapes have all of the measurement data interpolated to the same time for each scan. For TPS and Aerodynamic heating tapes the interpolated time occurs every second for the "fixed rate" tapes. In general, for "full rate" tapes every data scan contains approximately two seconds of data, but all of the data for each sensor is recorded at the rate specified in the master measurement list.

The amount of data that can be recorded on a CCT depends on the length of the tape, the tape density, and the number of words per record. In general, more data can be placed on a "fixed rate" tape than a "full rate".

The number of words on a tape can be calculated from:

$$\text{Words/Reel} = \frac{(\text{Inches/Reel}) (\text{Words/Record})}{[(\text{Inches/Frame})(\text{Words/Record})(\text{Frames/Word})+(\text{Inches/Record Gaps})]}$$

The number of records on a tape can be calculated from

$$\text{Records/Reel} = (\text{Words/Reel})/(\text{Words/Record})$$

The parameters for these equations are given in table IV for various tape densities.

The calculation to determine the amount of data that can be placed on a CCT depends on the number of measurements, the tape density, and the number of words/scan. The number of measurements determines the number of header records since each header record contains a maximum of 58 measurements. The number of data records is calculated as

$$\text{Data Records/Reel} = \text{Records/Reel} - \text{Header Records}$$

The number of data scans/reel is calculated as

$$\text{Data Scans/Reel} = (\text{Data Records/Reel}) (\text{Scans/Record})$$

or

$$\text{Data Scans/Reel} = (\text{Data Records/Reel}) / (\text{Records/Scan})$$

The maximum trajectory time interval that can be recorded can be calculated as

$$\text{Time Interval/Reel} = (\text{Data Scans/Reel}) (\text{Time Interval/Scan})$$

To simplify this into something meaningful for the general user the maximum time intervals have been calculated for some representative tape group ID's. This tabulation for "fixed rate" tapes is provided in Table V, and for "full rate" tapes in table VI. These values should be treated as guide lines only, since some tapes may be shorter than 1200 feet.

At the time this tape was written only 800 bpi tapes have been tested and checkout. NO problems are expected for 1600 bpi tapes. A checkout will be made for 6250 bpi tapes.

The most critical restriction is that the user must define the beginning and ending times. These times should be as accurate as possible.

Due to core limitations this program is restricted to a maximum of 450 measurements. For "full rate" tapes the maximum number of samples per scan for a measurement is restricted to 100 samples/scan (this corresponds to 50 samples/sec).

Files 1, 10, and 11 are used by the program, and must not be assigned prior to executing the program. File 1 is assigned to the CCT through an ERTRAN call to perform a dynamic use, and file 11 is assigned to the permanent word-

addressable file through an ETRAN call to perform a dynamic use.

If the user assigns the CCT tape external to the program it must have the file name TPE. There are no exceptions. If the program assigns the CCT the file name TPE must not be assigned to the run since the program assigns the tape to the temporary file TPE.

The permanent word-addressable file name must be input with exactly six characters. There are no exceptions. This file name must not exist in the master file directory.

This program requires approximately 65,000 words of core. It is not recommended for demand operation.

Due to the volume of print that can be obtained it is recommended that all printing be directed to microfiche.

3.6 ERROR MESSAGES

Only four basic types of errors can occur; errors in reading the CCT header, errors in reading the CCT data, errors in writing data from core to a word-addressable file, and errors in reading data from the word-addressable file. The error messages are generated under program control.

3.6.1 Error Messages Processing Header Records

FOUND AN UNEXPECTED END OF FILE UNABLE TO PROCEED. TERMED IN CCTHDR
An end of file was encountered while reading the header records.

DEVICE ERROR UNABLE TO PROCEED. TERMED IN CCTHDR
A read error was encountered while reading the header records.

TRANSMISSION ERROR UNABLE TO PROCEED. TERMED IN CCTHDR
A fatal error was encountered while reading the header records.

FOUND A NON-HEADER WHILE TRYING TO READ HEADERS UNABLE TO PROCEED. TERMED
IN CCTHDR
Self-explanatory.

TOO MANY MEASUREMENTS UNABLE TO PROCEED. TERMED IN CCTHDR
More than 450 measurements were on the CCT.

ERROR IN CHOICE OF PARAMETER "MSPS" CURRENTLY, MSPS = XXXX
THIS CCT REQUIRES MSPS, GE, XXXX
CHANGE MSPS IN CCTHDR, CCTPK2, CCTRD, CCT2WA
TO RECOMPILE AND PRODUCE A NEW ABSOLUTE CCT2WA
DO A "@BRKPT" AND "@ADD COMPILE/CCT"

3.6.2 Error Messages Processing Data Records

FOUND UNEXPECTED END OF FILE DURING CCTRD.
An end of file was encountered while reading the data records from the CCT.

DEVICE ERROR DURING CCTRD.
A read error was encountered while reading the data to the temporary word-
addressable file.

TRANSMISSION ABORTED DURING CCTRD.
A fatal error was encountered while reading the data records or while writing
the data to the temporary word-addressable file.

3.6.3 Error Messages Processing the Permanent Word-Addressable Files Preamble and Header Information

UNEXPECTED END OF FILE DURING CCTPK1
An end of file was encountered while reading the temporary word-addressable file.

DEVICE ERROR DURING CCTPK1
A read error was encountered while reading the temporary word-addressable file
or a write error was encountered while writing the permanent word-addressable
file.

TRANSMISSION ABORTED DURING CCTPK1

A fatal error was encountered while reading the temporary word-addressable file or while writing the permanent word-addressable file.

3.6.4 Error Messages Processing the Permanent Word-addressable Files Measurement Data

UNEXPECTED END OF FILE. TERMED IN CCTPK2

An end of file was encountered while reading the temporary word-addressable file or while writing the permanent word-addressable file.

DEVICE ERROR CAUSED TERM IN CCTPK2

A read error was encountered while reading the temporary word-addressable file or a write error was encountered while writing the permanent word-addressable file.

TRANSMISSION ABORTED IN CCTPK2

A fatal error was encountered while reading the temporary word-addressable file or while writing the permanent word-addressable file.

3.7 TIMING CONSIDERATIONS

The time required to process a CCT is very difficult to estimate, primarily due to insufficient information being currently available. The time required depends on the number of data scans, the number of scans/record or records/scan, and to a lesser degree the tape density. Since the program is I/O bound no other considerations are required.

In general, "full rate" CCT's take more time to process than do "fixed rate" CCT's. A summary of the available timing information for different CCT's is provided in Table VII. This information can be used to approximate the time required for an individual computer run.

3.8 FILES USED BY THE PROGRAM

The following files are used by th program:

<u>EXTERNAL FILE NAME</u>	<u>INTERNAL FILE NAME</u>	<u>DESCRIPTION</u>
TPE	1	The input CCT
	10	The temporary word-addressable file
(user defined see IFILE in Appendix A)	11	The permanent word-addressable file

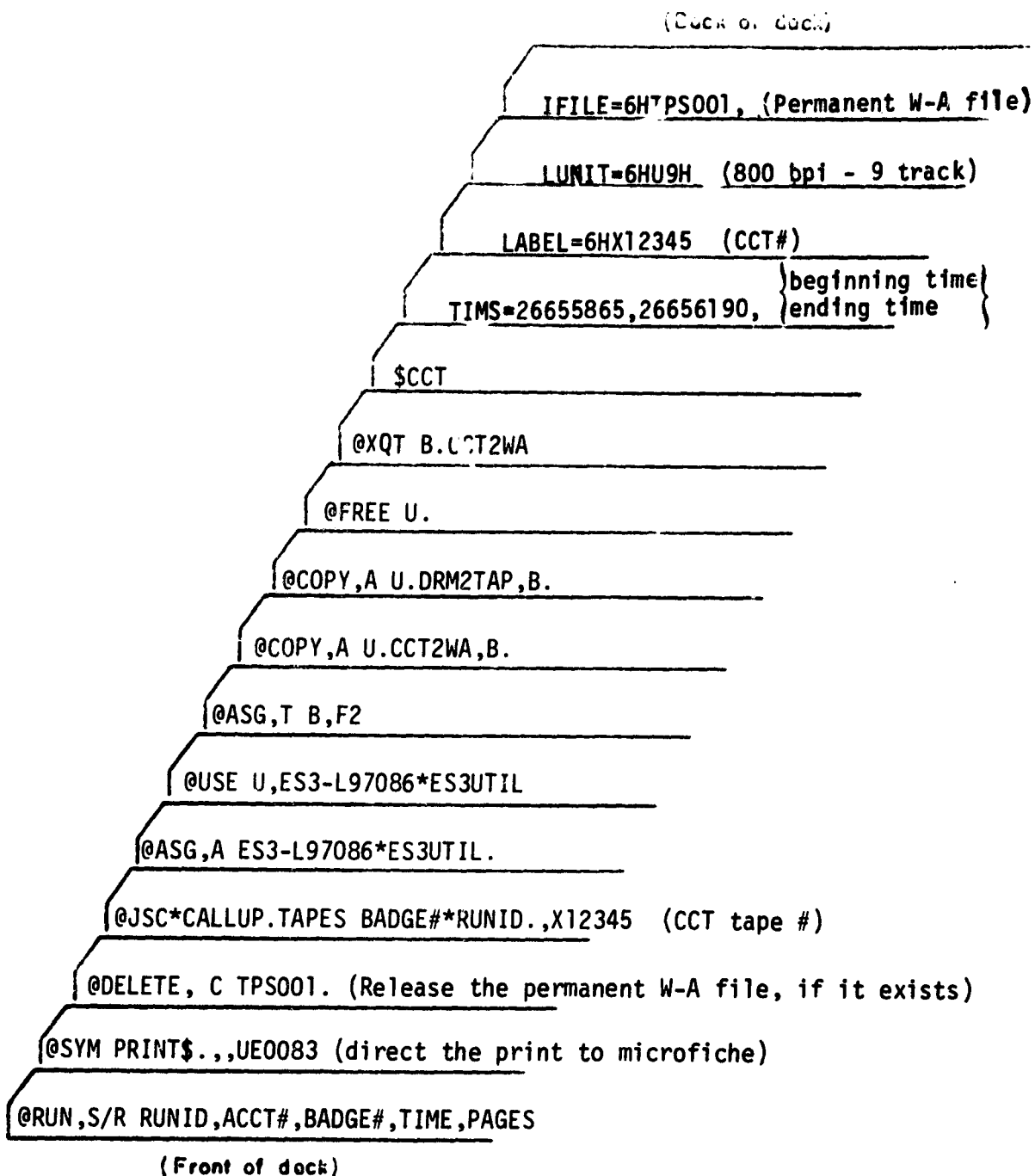


Figure 1.— Deck setup when the program assigns the CCT.

(Back of deck)

```

IFILE=6HTPS004. (Permanent W-A file)
ITAPE=1. (CCT already assigned)
TIMS=26655865,26656190 }beginning time
                        }ending time
$CCT
@XQT B.CCT2WA
@FREE U.
@COPY,A U.DRM2TAP,B.
@COPY,A U.CCT2WA,B.
@ASG,T B,F2
@USE U,ES3-L97086*ES3UTIL.
@ASG,A ES3-L97086*ES3UTIL.
@ASG,T TPE,U9S,X54321 (assign the CCT as 9 track, 6250 bpi)
@JSC*CALLUP.TAPES BADGE#*RUNID.,X54321 (CCT tape #)
@DELETE,C TPS004. (Release the permanent W-A file, if it exists)
@SYM PRINT$.,UE0083 (Direct the print to microfiche)
@RUN,S/R RUNID,ACCT#,BADGE#,Time,Pages
  
```

(Front of deck)

Figure 2.— Deck setup when the program does not assign the CCT.

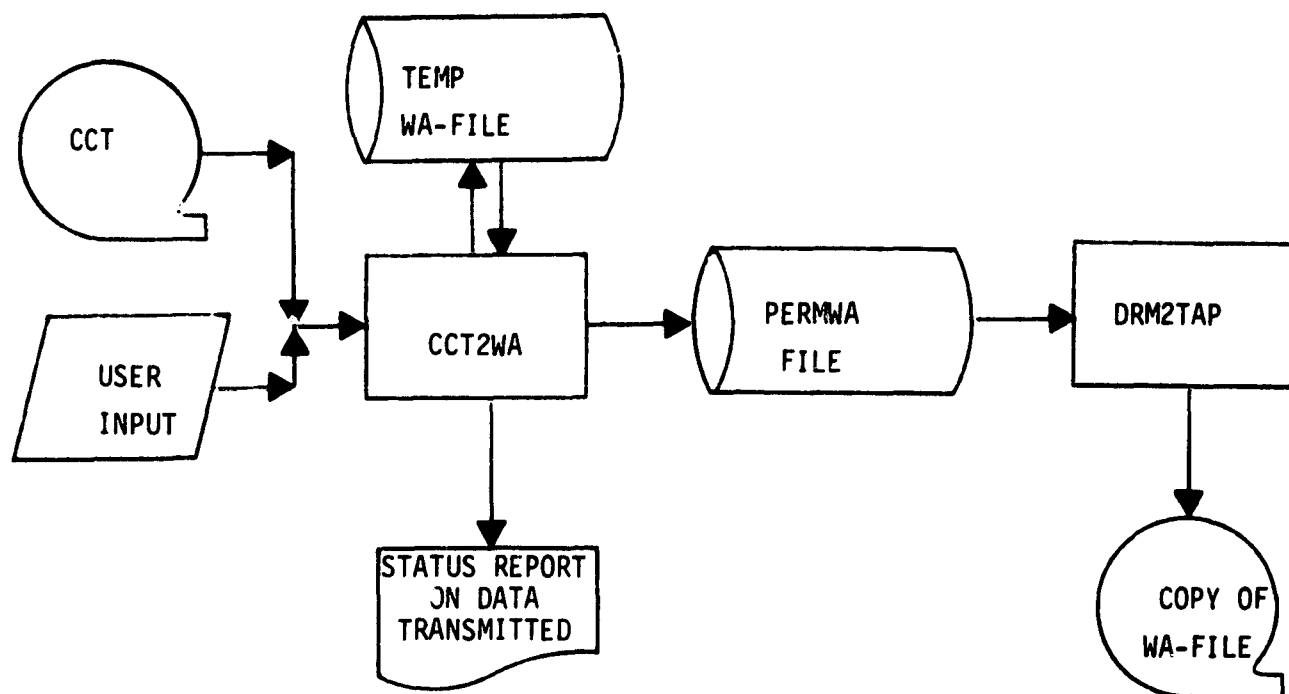


Figure 3.— Schematic flow of the CCT2WA system.

PREAMBLE AND HEADERS

1-2 . TAPE GROUP ID (A4,A6)
 3 . INPUT START TIME
 4 . INPUT END TIME
 5 . JFIX (= 0 IF TAPE IS FIXED RATE)
 6 . ADDRESS OF DATA SCAN TIMES
 7-16 . ADDRESS OF SKEWS FOR SOURCES 1 - 10
 17 . M (= NO. OF MIDS)
 18 . S (= NO. OF SCANS)
 19 . GRAND TOTAL OF DATA ON THIS FILE
 20-21 . BASE TIME GMT (DOUBLE PRECISION)
 22-30 . BLANK FILL

31 . ADDRESS OF DATA FOR EACH MID
 30+M .

31+M . MEASUREMENT IDS (A6,A4)
 30+32M .

31+32M . NO. OF SAMPLES PER SCAN
 30+42M .

31+42M . DELTA TIME FOR FIRST SAMPLE
 30+52M .

31+52M . DELTA TIME BETWEEN CONTIGUOUS SAMPLES
 30+62M .

31+62M . SKEW SOURCES (1-10) FOR EACH MID
 30+72M .

31+72M . ENGINEERING UNITS (A2,A6)
 30+82M .

31+82M . NO. OF DATA POINTS FOR EACH MID (NPT)
 30+102M .

TIME DATA

$K = 30 + 102M$

K+1 . SKEW FOR EACH SCAN FROM SOURCE 1
 K+8 .

K+925+1 . SKEW FOR EACH SCAN FROM SOURCE 10
 K+1025 .

K+1025+1 . DATA SCAN TIMES (REL. TO BASE TIME)
 K+1125 .

DATA SCANS

$L = K + 1125$
 $= 30 + 102M + 1125$

L+1 . DATA FOR FIRST MEASUREMENT ID
 L+NPT(1) .

DATA FOR MEASUREMENT 'J' STARTS AT

$L + NPT(1) + \dots + NPT(J-1) + 1$

AND CONTINUES UNTIL WORD

$L + NPT(1) + \dots + NPT(J)$

ALL DATA IS STORED AS SINGLE PRECISION!

OCTAL FLAG VALUES ARE RETAINED!

TOTAL WORDS IN FILE:

$30 + 102M + 1125 + NPT(1) + \dots + NPT(M)$

Figure 4.— Schematic sketch of the permanent word-addressable file structure.

TABLE I CCT - HEADER RECORDS

<u>WORD</u>	<u>CHAR.</u>	<u>DECODE FORMAT SPEC.</u>	<u>CONTENTS</u>
1	1-2		The value 4000 octal (indicates header record).
1,2	3-6,1-6	A4,A6	Tape group ID (left adjusted).
3	1-3	I3	Number of physical records for this header (1 to m).
3	4-6		Sequential record counter for this header
4	1-6	I6	Size of data records associated with this header (bits).
5	1-6	I6	Scans per data record. (If this value is negative, then absolute value indicates number of records per scan).
6,7	1-6,1-2	A6,A2	Local date this tape was written (MM/DD/YY).
7,8	3-6,1-4	A6,A2	Local time this tape was written (HH:MM:SS).
8	5-6	2X	Spare
9	1-6	I6	Size of scan (bits).
10	1-6	A6	Software version number.
11	1-6	A6	Spec. calc name or blank.
12-16		30X	Spare
17,18	1-6,1-4	A6,A4	Measurement number (Terminator = ZZZZZZZZ)
18,19	5-6,1-2	I4	Samples per scan for this measurement.
19	3-6	I4	Word number in scan containing first sample for this measurement.
20	1-6	F6.0	Time delta for first sample for this measurement, including decimal point (seconds).
21	1-6	F6.0	Time delta between contiguous samples for this measurement, including decimal point (seconds).
22	1	I1	=1 for single precision (36 bits), 2 for double precision (72 bits), 3 for integer
22	2-3	I2	Word number in scan containing time skew for this measurement.
22	4	1X	Spare
22,23	5-6,1-6	A2,A6	Engineering Units
24	1-6	6X	Spare
25-32			Same as words 17-24 for the next measurement.
⋮			
473-480			Same as words 17-24 for the next measurement.

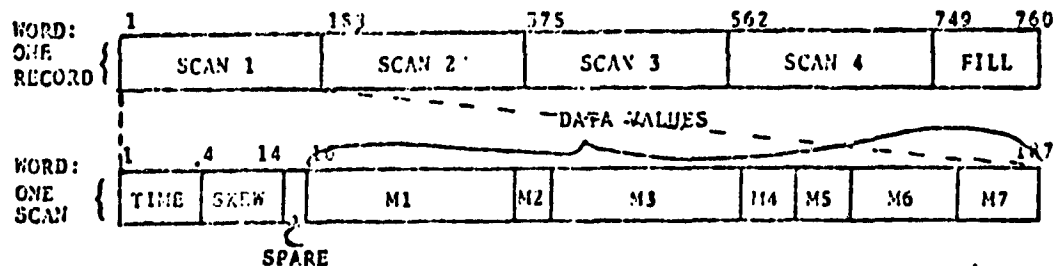
TABLE II - DATA SCANS AND DATA RECORDS

DATA SCANS

<u>Word</u>	<u>Format</u>	<u>Contents</u>
1	Integer	Year (year tape was written A.D.)
2-3	Db1. Prec. UNIVAC Floating Point	Time for this scan (seconds). Includes days if GMT.
4-13	Sgl. Prec. Pl. Pt.	Skew for sources 1 to 10 seconds.
14-15		Spares
16-end	Sgl. or Db1. Prec. UNIVAC PF. Pt.	Data values and fill. All data values for same measurement will be contiguous within a scan.

DATA RECORDS

All physical data records pertaining to the same header will be of equal size and an integral multiple of 40 36-bit words. Maximum record size is 800 36-bit words. A graphic example of a physical data record containing 187-word scans for measurements M1 to M7 follows (scans/record in header = 4).



The following illustrates the configuration of a scan 1784 words in length (scans/record in header = -3):

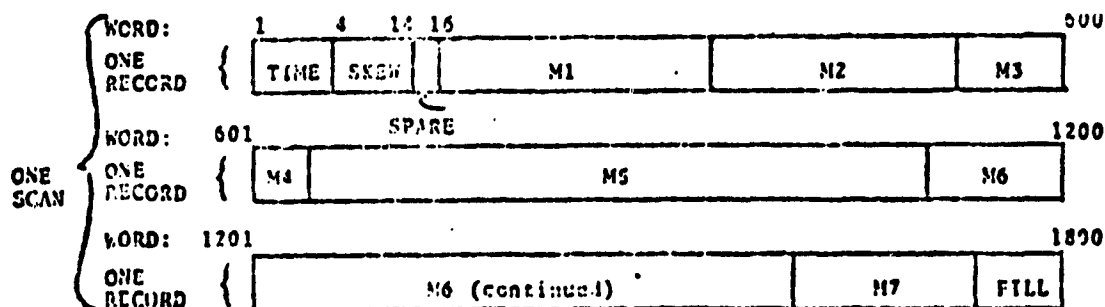


TABLE III - CCT SPECIAL FLAG VALUES

The user should be cognizant of certain special flag values in order to properly process data. The flag values are as follows:

1. Any data value = 377000000001 octal -- indicates data value was lost due to decommutator synchronization loss.
2. Any data value = 377000000002 octal -- indicates data value missing due to parity errors, record length errors, or other such malfunctions within the data collection process.
3. Any data value = 377000000003 octal -- indicates data value undefined due to its being the result of an undefined arithmetic operation (such as division by zero) or because it is the result of computations that could not be performed because input values were not available because of (1) or (2).
4. Any data value = 377000000004 -- indicates data was off-scale low.
5. Any data value = 377000000005 -- indicates data was off-scale high.
6. YEAR = 1 (word 1 of each data scan) -- indicates end of data scans.
There will be no good data in this scan and the next physical record will be either an end-of-file mark or a header record. For the case where the scan comprises more than one physical record, all records for the scan will be written to the tape whether or not YEAR = 1. Flags (1) to (5) are right adjusted with zero fill when replacing double precision values.

TABLE IV 9 TRACK TAPE PARAMETERS

<u>DENSITY</u>	<u>INCHES PER FRAME</u>	<u>INCHES PER RECORD GAP</u>	<u>FRAMES PER WORD</u>	<u>MAXIMUM TAPE LENGTH (FT)</u>
800	0.001250	0.6	4.5	1200
1600	0.000160	0.3	4.5	1200
6250	0.000625	0.3	4.5	1200

TABLE V — MAXIMUM TIME INTERVALS FOR FIXED RATE TAPES ON A 1200 FOOT REEL

<u>TPS GROUP</u>	<u>NO OF MEAS.</u>	<u>NO OF HEADERS</u>	<u>SCANS PER RECORD</u>	<u>WORDS PER RECORD</u>	<u>TIME IN SECONDS FOR TAPE DENSITY</u>		
					<u>6250 bpi</u>	<u>1600 bpi</u>	<u>800 bpi</u>
TPS01	124	3	6	760	101,964	35,424	17,700
TPS02	257	5	3	800	49,299	16,926	8,454
TPS03	309	6	2	640	37,842	13,702	6,844
TPS04	416	8	1	440	23,338	9,357	4,674
TPS05	149	3	5	760	84,970	29,520	14,750

TABLE VI — MAXIMUM TIME INTERVALS FOR FULL RATE TAPES ON A 1200 FOOT REEL

<u>TPS GROUP</u>	<u>NO OF MEAS.</u>	<u>NO OF HEADERS</u>	<u>SCANS PER RECORD</u>	<u>RECORDS PER SCAN</u>	<u>WORDS PER RECORD</u>	<u>TIME IN SECONDS FOR TAPE DENSITY</u>		
						<u>6250 bpi</u>	<u>1600 bpi</u>	<u>800 bpi</u>
TPS01	124	3	3	-	800	98,609	33,863	16,920
TPS02	257	5	-	3	800	10,953	1,880	939
TPS03	309	6	1	-	720	35,178	12,374	6,180
TPS04	416	8	-	2	440	23,338	9,357	4,674
TPS05	149	3	2	-	600	78,676	28,968	14,476

TABLE VII - RUN TIME EXPERIENCE

<u>TAPE ID</u>	<u>NO OF MEAS.</u>	<u>NO OF HEADERS</u>	<u>TYPE OF CCT (RATE)</u>	<u>SCANS PER RECORD</u>	<u>RECORD PER SCAN</u>	<u>WORDS PER RECORD</u>	<u>NUMBER OF SCANS</u>	<u>TAPE DENSITY</u>	<u>RUN TIME (MIN)SEC)</u>
CTPS01	124	3	Full	3	-	800	517	800	1:50
CTPS02	257	5	Full	-	3	800	517	800	10:36
CTPS03	309	6	Full	1	-	720	517	800	3:57
CTPS04	416	8	Full	-	2	440	517	800	4:54
CTPS05	149	3	Full	2	-	600	121	800	0:59
CTCS01	411		Full					800	2:31
CTCS01L	411		Fixed	1	-			800	1:27
CDLEE6	434	8	Full	-	2	680	1806	800	21:01
CTPS01	124	3	Full	3	-	800	234	1600	1:14
CTPS02	257	5	Full	-	3	800	234	1600	5:25
CTPS03	309	6	Full	1	-	720	234	1600	2:18
CTPS04	416	8	Full	-	2	440	234	1600	2:50
CTPS05	149	3	Full	2	-	640	34	1600	0:48
CDLEE6	436	8	Full	-	2	680	315	800	4:56

APPENDIX A
DATA INPUT TO
THE PROGRAM

All data input to the program is under NAMELIST control name \$CCT.

<u>NAME</u>	<u>DESCRIPTION</u>						
TIMS	<p>A two dimensional variable representing, in seconds, the beginning and ending times (GMT) requested for the CCT. These two values are used to determine the size required for the temporary file. An example using GMT would be:</p> <p style="text-align: center;">TIMS = 2665584, 26655990,</p>						
TSTEP	<p>Time step interval for CCT data scans. The default value is 1.0 seconds.</p>						
LABEL	<p>The CCT tape number, i.e.,</p> <p style="text-align: center;">LABEL = 6HX12345</p>						
NCHAR	<p>The number of characters in LABEL. The default value is 6.</p>						
LUNIT	<p>This is used to define the density and type of tape drive required for the CCT. The possible values and meaning are:</p> <table><tr><td>LUNIT = 6HU9H</td><td>- 800 bpi 9 track</td></tr><tr><td> = 6HU9V</td><td>-1600 bpi 9 track</td></tr><tr><td> = 6HU9S</td><td>-6250 bpi 9 track</td></tr></table> <p>The default value is U9V.</p>	LUNIT = 6HU9H	- 800 bpi 9 track	= 6HU9V	-1600 bpi 9 track	= 6HU9S	-6250 bpi 9 track
LUNIT = 6HU9H	- 800 bpi 9 track						
= 6HU9V	-1600 bpi 9 track						
= 6HU9S	-6250 bpi 9 track						
ITAPE	<p>A flag which indicates whether the CCT has been assigned outside the program or if the program must assign the tape. The possible values and meaning are</p> <p style="text-align: center;">ITAPE = 0, The program will assign the tape = 1, The user has assigned the CCT with a file name of TPE.</p> <p>The default value is 0.</p>						
LIST	<p>A flag to indicate if all intermediate information is to be printed or if only a short summary of the information is to be printed. If</p> <p style="text-align: center;">LIST = 0, full print = 1, summary print only.</p> <p>The default value is 0.</p>						
IFILE	<p>The name of the permanent word-addressable file. This name must be exactly six characters, i.e.</p> <p style="text-align: center;">IFILE = 6HTPS001,</p>						